**3GPP TSG-CT WG3 Meeting #130 *C3-234428r1***

**Xiamen, China, 9 - 13 October, 2023**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **29.552** | **CR** | **0077** | **rev** | **-** | **Current version:** | **18.2.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Add the ML Model Training Procedures and update the ML Model Provisioning Procedures | | | | | | | | | |
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| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNA\_Ph3 | | | | |  | ***Date:*** | | | 2023-09-27 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In TS 23.288 clause 6.2F, the procedure for ML Model Training is introduced for general purpose, the corresponding general procedures for ML Model Training are missing in TS 29.552.  In addition, incorrect references cited for the Nnwdaf\_MLModelProvision\_Subscribe and the Nnwdaf\_MLModelProvision\_Notify service operations in the ML Model provisioning procedures in clause 5.6.2.  This CR proposes to add the ML Model Training procedures, and correct the errors in the ML Model provisioning procedures. | | | | | | | | |
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| ***Summary of change:*** | | The changes include:   * Added the ML Model Training Procedures to clause 5.6A. * Changed the reference "clause 4.4.2.2" to "clause 4.5.2.2" in TS 29.520 for the Nnwdaf\_MLModelProvision\_Subscribe service operation in step 1, changed the reference "clause 4.4.2.4" to "clause 4.5.2.4" in TS 29.520 for the Nnwdaf\_MLModelProvision\_Notify service operation in step 3 of the ML Model provisioning procedures in clause 5.6. | | | | | | | | |
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| ***Consequences if not approved:*** | | The ML Model Training procedures are missing in stage 3 specification, and errors exist in the ML Model provisioning procedures. | | | | | | | | |
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| ***Clauses affected:*** | | 5.6.2, 5.6A(new), 5.6A.1(new), 5.6A.2(new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**Proposed changes:**

\*\*\* 1st Change \*\*\*

### 5.6.2 ML Model Subscribe/Unsubscribe/Notify procedure

The procedure is used by an NF service consumer to subscribe to/unsubscribe from the ML model information on the related Analytics on NWDAF containing MTLF, and also used by the NWDAF containing MTLF to notify the ML model information to the NF service consumer if it subscribed to the ML model information previously.



Figure 5.6.2-1: ML Model Subscribe/Unsubscribe/Notify procedure

1. In order to subscribe to ML model information, the NF service consumer invokes Nnwdaf\_MLModelProvision\_Subscribe service operation by sending an HTTP POST request targeting the resource "NWDAF ML Model Provision Subscriptions", as described in clause 4.5.2.2 of 3GPP TS 29.520 [5]. See 3GPP TS 29.520 [5] clause 5.4 for details.

In order to modify the existing subscription, the NF service consumer invokes Nnwdaf\_MLModelProvision\_Subscribe service operation by sending an HTTP PUT request with Resource URI of the resource "Individual NWDAF ML Model Provision Subscription".

2. The NWDAF containing MTLF responds to the Nnwdaf\_MLModelProvision\_Subscribe service operation. Upon receipt of the HTTP POST request, if the subscription is accepted to be created, the NWDAF containing MTLF responds to the NF service consumer with "201 Created", and the URI of the created subscription is included in the Location header field.

Upon receipt of the HTTP PUT request, if the subscription is accepted to be updated, the NWDAF containing MTLF responds to the NF service consumer an HTTP "200 OK" with a response body containing a representation of the updated subscription or "204 No Content".

3. If the NWDAF containing MTLF determines that the subscribed ML model information is available, the NWDAF containing MTLF invokes Nnwdaf\_MLModelProvision\_Notify service operation to report the ML model information by sending an HTTP POST request to the NF service consumer identified by the notification URI received during the creation/modification of the subscriptions, as described in clause 4.5.2.4 of 3GPP TS 29.520 [5].

4. The NF service consumer responds to the NWDAF containing MTLF with an HTTP "204 No Content" message.

5. In order to unsubscribe from the notification(s) of the ML model information, the NF service consumer invokes Nnwdaf\_MLModelProvision\_Unsubscribe service operation by sending an HTTP DELETE request, which targets the resource "Individual NWDAF ML Model Provision Subscription", to the NWDAF containing MTLF.

6. If the request is accepted, the NWDAF containing MTLF deletes the subscription and responds to the NF service consumer with an HTTP "204 No Content" message.

NOTE: For details of Nnwdaf\_MLModelProvision\_Subscribe/Unsubscribe/Notify service operations refer to 3GPP TS 29.520 [5].

\*\*\* 2nd Change (new) \*\*\*

## 5.6A ML Model Training procedures

### 5.6A.1 General

The ML Model training procedures allow the NF service consumers (i.e. NWDAF containing MTLF) to subscribe to another NWDAF (i.e. an NWDAF containing MTLF) for a trained ML model and/or the information about ML model training based on the ML model provided by the consumer and the data for the training.

### 5.6A.2 ML Model Training Subscribe/Unsubscribe/Notify procedure

The procedure is used by an NF service consumer to subscribe to/unsubscribe from the ML model training, and also used by the NWDAF containing MTLF to notify the ML model and/or ML model training information to the NF service consumer if it subscribed to the ML model and/or ML model training information previously.



Figure 5.6A.2-1: ML Model Training Subscribe/Unsubscribe/Notify procedure

1. In order to subscribe to ML model and/or ML model training information, the NF service consumer invokes Nnwdaf\_MLModelTraining\_Subscribe service operation by sending an HTTP POST request targeting the resource "NWDAF ML Model Training Subscriptions", as described in clause 4.6.2.2 of 3GPP TS 29.520 [5]. See 3GPP TS 29.520 [5] clause 5.5 for details.

In order to modify the existing subscription, the NF service consumer invokes Nnwdaf\_MLModelTraining\_Subscribe service operation by sending an HTTP PUT request or an HTTP PATCH request with Resource URI of the resource "Individual NWDAF ML Model Training Subscription".

2. The NWDAF containing MTLF responds to the Nnwdaf\_MLModelTraining\_Subscribe service operation. Upon receipt of the HTTP POST request, if the subscription is accepted to be created, the NWDAF containing MTLF responds to the NF service consumer with "201 Created", and the URI of the created subscription is included in the Location header field.

Upon receipt of the HTTP PUT request or the HTTP PATCH request, if the subscription is accepted to be updated, the NWDAF containing MTLF responds to the NF service consumer an HTTP "200 OK" with a response body containing a representation of the updated subscription or "204 No Content".

3. If the NWDAF containing MTLF determines that the subscribed ML model and/or ML model training information is available, the NWDAF containing MTLF invokes Nnwdaf\_MLModelTraining\_Notify service operation to report the ML model and/or ML model training information by sending an HTTP POST request to the NF service consumer identified by the notification URI received during the creation/modification of the subscriptions, as described in clause 4.6.2.4 of 3GPP TS 29.520 [5].

4. The NF service consumer responds to the NWDAF containing MTLF with an HTTP "204 No Content" message.

5. In order to unsubscribe from the notification(s) of the ML model and/or ML model training information, the NF service consumer invokes Nnwdaf\_MLModelTraining\_Unsubscribe service operation by sending an HTTP DELETE request, which targets the resource "Individual NWDAF ML Model Training Subscription", to the NWDAF containing MTLF.

6. If the request is accepted, the NWDAF containing MTLF deletes the subscription and responds to the NF service consumer with an HTTP "204 No Content" message.

NOTE: For details of Nnwdaf\_MLModelTraining\_Subscribe/Unsubscribe/Notify service operations refer to 3GPP TS 29.520 [5].

\*\*\* End of Changes \*\*\*